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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,814	04/04/2002	Makoto Uchida	10059-413US (P26104-01)	5588
570	7590	10/20/2004	EXAMINER	
AKIN GUMP STRAUSS HAUER & FELD L.L.P. ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103-7013			TSANG FOSTER, SUSY N	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/089,814

Applicant(s)

UCHIDA ET AL.

Examiner

Susy N Tsang-Foster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 6-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>20020404</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, Claims 1-5 in the reply filed on 8/2/2004 is acknowledged. The traversal is on the ground(s) that no holding of non-unity of invention under PCT Rule 13.1 was made in the International Phase of the PCT application and that in the International Search Report, all 14 claims were searched together and therefore all 14 claims should be examined together in the National Phase. This is not found persuasive because according to Rule 37 CFR 1.499, the Examiner may hold lack of unity at the National Stage under 37 CFR 1.475 at any time before the final action.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 6-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 8/2/2004.

### ***Information Disclosure Statement***

3. The information disclosure statement filed on 4 April 2002 has been considered by the Examiner.

### ***Drawings***

4. Figure 7b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR

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1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claim 4, the limitation "particle sizes of hydrogen ion conductive polymer electrolyte adsorbed to said first and second carbon particles are within a range of 30 to 200 nm and a range of 200 to 500 nm, respectively, when measured by a light-scattering photometer" does not appear to be in the specification.

### *Claim Rejections - 35 USC § 112*

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the limitation “mutually different dispersed states” is indefinite because it is unclear what this term means since the final electrode structure comprising the two different types of carbon particles as disclosed in paragraphs 84 and 85 of the instant specification was formed by dispersing a mixture comprising the two different types of carbon particles by a bead mill to form the catalyst layer.

Claims depending from claims rejected under 35 USC 112, second paragraph are also rejected for the same.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. As best understood, claims 1-3, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (US 5,728,485).

Watanabe et al. disclose a polymer electrolyte fuel cell comprising a hydrogen ion conductive polymer electrolyte membrane, and a pair of electrodes having catalyst layers sandwiching the hydrogen ion conductive polymer electrolyte membrane therebetween and gas diffusion layers in contact with the catalyst layers (see Figure 1 and col. 1, lines 13-40). The electrode can be fabricated by two different kinds of catalyst carbon supports that are in mutually different dispersed states in a polymer electrolyte (see Figure 6 and col. 7, lines 1-28, and lines 59-63). The first kind of catalyst carbon support is granular carbon having a particle diameter of

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100 to 1000 angstroms (col. 6, lines 56-61). The second kind of catalyst carbon support is carbon fibers which are carbon particles having a length between 100 to 1000 angstroms and diameter between 0.1 and 10 microns (col. 6, lines 46-51). The carbon fibers used have a surface area of 1750 m<sup>2</sup>/g with an average diameter of 1 micron (col. 9, lines 40-55).

It is noted that the granular carbon particles supporting the catalyst is coated with a first electrolyte solution and dried and a second electrolyte solution (col. 3, lines 19-30). The electrode prepared with this coated granular carbon particles has secure contact between the catalyst and the solid polymer electrolyte and a smooth formation of the electrocatalyst layer on the electrode substrate can be formed because the bonding strength among the solid polymer electrolytes coating the catalyst supports (the second carbon particles) is elevated by the second solid polymer electrolyte layer on the granular carbon particles as well (col. 3, lines 30-42).

Since a smooth formation of the catalyst layer of the electrode would inherently have a 85 glossiness of a surface of the catalyst layer of the electrode measured by an evaluation method of JIS-Z8741 is not less than 20%.

10. As best understood, claims 1-3, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (US Pat. No. 5,766,788).

Inoue et al. disclose a polymer electrolyte fuel cell comprising an electrode comprising carbon catalyst-loading particles have two particle distribution peaks (abstract and col. 1, lines 5-12). The platinum-carbon catalyst is first pulverized for 40 minutes by a planetary ball mill which was made of zirconia to give a particle distribution having one peak between 0.1 and 1 micron and another peak between 1.0 and 10 micron (col. 4, lines 15-23). The pulverized carbon

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catalyst was impregnated with a commercially dispersed solution of ion exchange resin (NAFION, col. 4, lines 25-32). The carbon catalyst coated with NAFION was added to ethanol and the mixture was dispersed for two minutes with an ultrasonic homogenizer and the resulting dispersion was transferred onto carbon paper to prepare the electrode (col. 4, lines 1-46). Since the pulverized carbon particles have a particle size distribution that overlaps with that disclosed in the instant application, the homogenized mixture applied to the carbon paper to form the electrode results in a dense and smooth catalyst layer that would inherently have a 85 glossiness of a surface of the catalyst layer of the electrode measured by an evaluation method of JIS-Z8741 is not less than 20%.

11. As best understood, claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by the IPDL JPO Machine Translation for JP 10-189004 A.

The IPDL JPO Machine Translation for JP 10-189004 A discloses a polymer electrolyte fuel cell (paragraphs 1-3) comprising an electrode using two or more carbon catalyst support particles with different water repellence (paragraphs 13 and 29).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

st/ *Susy Tsang-Foster*

Susy Tsang-Foster  
Primary Examiner  
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